

CONVENTION APPLICATION FOR STANDARD
PATENT OR A STANDARD PATENT OF ADDITION

566600

Full name(s) of
Applicant(s)

I/Wo ANDRÉ GASS

Address(es) of
Applicant(s)of 6, Avenue de la Marseillaise,
67000 Strasbourg (Bas-Rhin),
Francehereby apply for the grant of a standard patent
for an invention entitled
"SEMI-SUBMERSIBLE MARINE VEHICLE"Title of
invention

which is described in the accompanying complete specification.

DETAILS OF BASIC APPLICATION(S)

Number(s) of Basic Application(s)

84.08631

Name(s) of Convention Country(ies) in which Basic
Application(s) was/were filed

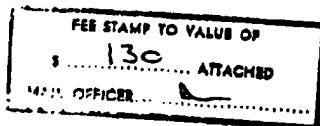
France

(respectively)

Date(s) of Basic Application(s)

29 May 1984

(respectively)

LODGED AT SUB-OFFICE
28 MAY 1985
Sydney

My/Our address for service is:

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AUSTRALIA

Dated this 21 day of May

1985

André Gass

To: The Commissioner of Patents
SFP2

12/83

COMMONWEALTH OF AUSTRALIA

THE PATENTS ACT 1952

DECLARATION IN SUPPORT OF A
CONVENTION APPLICATION FOR A PATENTIn support of the Convention Application made for a
patent for an invention entitled:AUSTRALIA
CONVENTION
STANDARD
& PETTY PATENT
DECLARATION
SFP4

Title of Invention

"SEMI-SUBMERSIBLE MARINE VEHICLE"

I/We ANDRÉ GASS

Full name(s) and
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Declarant(s)of 6, Avenue de la Marseillaise,
67000 Strasbourg (Bas-Rhin),
France

do solemnly and sincerely declare as follows:-

Full name(s) of
Applicant(s)

- I am/We are the applicant(s) for the patent
(or, in the case of an application by a body corporate)
+---+ am/We are authorised by

the applicant(s) for the patent to make this declaration on
+---+ their behalf.

- The basic application(s) as defined by Section 141 of the
Act was/were made

in France

on 29 May 1984

by ANDRÉ GASS

Full name(s) and
address(es) of
inventor(s)

- I am/We are the actual inventor(s) of the invention referred
to in the basic application(s)
(or where a person other than the inventor is the applicant)

3.

of-

(respectively)

-is/are the actual inventor(s) of the invention and the facts upon
which the applicant(s) is/are entitled to make the application are
as follows:

Set out how Applicant(s)
derive title from actual
inventor(s) e.g. The
Applicant(s) is/are the
assignee(s) of the
invention from the
inventor(s)

- The basic application(s) referred to in paragraph 2 of this
Declaration was/were the first application(s) made in a Convention
country in respect of the invention(s) the subject of the application.

Declared at Strasbourg this 21 day of May 1985

(12) AUSTRALIAN PATENT ABRIDGMENT

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(54) SUBMERSIBLE MARINE VEHICLE

(75) ANDRE GASS

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(57) Claim

1. A semi-submersible marine vehicle suitable for operation on a water's surface or semi-submersed, said marine vehicle comprising a spherical shaped compartment supported by a plurality of floats, said compartment housing a plurality of seats and propulsion means, wherein said propulsion means allows manual driving when the vehicle is on the surface of the water and motor assisted driving when semi-submersed, said compartment being water-tight and transparent, and wherein each float contains a ballast.

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SPRUSON & FERGUSON

FORM 10

COMMONWEALTH OF AUSTRALIA
PATENTS ACT 1952

COMPLETE SPECIFICATION

(ORIGINAL)

FOR OFFICE USE:

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Complete Specification Lodged:

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Complete Specification for the invention entitled:

"SEMI-SUBMERSIBLE MARINE VEHICLE"

The following statement is a full description of this invention,
including the best method of performing it known to us

-1-

DESCRIPTIVE ABSTRACT

The invention refers to a semi-submersible marine vehicle with propulsion on the surface and in semi-submersion and composed essentially of two floats and seats placed between the latter.

This semi-submersible marine vehicle is characterized by the fact that it comprises, in one piece with the two tubular floats (2, 3) a balloon-shaped binnacle (11), watertight and transparent, whose height (49) is greater than the depth of dive (13) and enclosing means of propulsion on the surface (28, 29) using the muscular energy of the passengers, means of propulsion in semi-submersion (40) and control and safety equipment.

The invention concerns leisure craft, for use essentially on beaches and the edges of lakes.

1. The invention relates to a semi-submersible marine vehicle with propulsion on the surface and in semi-submersion and composed essentially of two floats and seats placed between the latter.
5. For leisure amusement at the seaside, marine vehicles of the "Pedalo" type have been designed, allowing the users to move on the surface of the water. These vehicles comprise two floats placed in parallel whose length, section and material ensure floatability on water. Between these two floats are 10 seats permitting the users to assume a seated position so that they can activate with their feet pedals which turn either a paddle wheel or a screw at the rear of the marine vehicle. Thus the propulsion of this vehicle is ensured by the muscular energy of the users. In case of fatigue, the users stop 15 pedalling, and the marine vehicle bobs up and down on the waves. These vehicles, however, cannot be used for the observation of marine fauna and flora.

That is why many holidaymakers advocate diving and underwater hunting to observe the aquatic environment and 20 in particular the submarine fauna and flora. It is, however, necessary on the one hand to provide the appropriate equipment, and on the other hand the user must have the necessary physical condition for this sport. Since this submarine diving is not without danger, the divers have to 25 submit to certain safety rules, but the latter frequently constitute a constraint.

We also know of the pocket submarines used either for warfare, or as peaceful devices for explorations and interventions underwater. But these devices cannot be used 30 as instruments of leisure, and they call for considerable training of the users and highly developed physical conditions.

The purpose of this invention is to create a semi-submersible marine vehicle which has the advantages of a

leisure craft of the "Pedalo" type, while allowing these advantages to be combined with those of underwater diving and the observation of underwater fauna and flora.

In accordance with one broad form the present invention provides a semi-submersible marine vehicle suitable for operation on a water's surface or semi-submersed, said marine vehicle comprising a spherical shaped compartment supported by a plurality of floats, said compartment housing a plurality of seats and propulsion means, wherein said propulsion means allows manual driving when the vehicle is on the surface of the water and motor assisted driving when semi-submersed, said compartment being water-tight and transparent, and wherein each float contains a ballast.

The invention will be clearly understood by referring to the following description which is given as a non-limitative example and to the attached drawings in which:

- 10.15 - Figure 1 is a view in perspective of the semi-submersible marine vehicle in conformity with the invention
- 10.20 - Figure 2 is a partial view in perspective of the open binnacle
- 10.25 - Figure 3 is a view in elevation of this semi-submersible marine vehicle, the front part of the floats being truncated
- 10.30 - Figure 4 is a front view of the semi-submersible marine vehicle
- 10.35 - Figure 5 is a view in plane of the semi-submersible marine vehicle.

We refer to the various Figures. The semi-submersible marine vehicle 1 comprises two tubes 2, 3 disposed in parallel to the median vertical plane 4 and forming the floats of this marine vehicle 1. The stability of the latter is obtained by two ballasts 5, 6 preferably made from inflatable rubber and housed in these tubes 2, 3. The tubes 2, 3 present at their front 7 and rear 8 extremities openings 9, 10.

Four inflatable sections are located in the forward and rearward ends of the tubes 2, 3. These are connected in pairs left/right or front/rear such that listing is corrected by inflating or deflating one side pair relative to the other and trim is corrected by inflating or deflating the front pair relative to the rear pair or vice-versa.

The tubes 2, 3 are connected to a binnacle 11 shaped like a balloon. This binnacle 11 is made from transparent

material allowing the users to have a panoramic view and observe the marine flora and fauna. The height 49 of this binnacle 11 is greater than the depth of dive 13 so that only the lower part 12 of the binnacle 11 is submerged. The

5 references 14₁ and 14₂ on figure 4 refer to the surface of the water when the marine vehicle 1 is floating on the water (mark 14₁) and when the marine vehicle 1 is in semi-submersion (mark 14₂). This binnacle 11 can take two to three passengers and has seats 15, 16. The binnacle 11 is covered by a cupola 17
10 which can be folded back round a horizontal axis of articulation 18. This cupola 17 can be activated by a handle 19 and is surmounted by a snorkel 20. This handle 19 can lock the cupola 17 and has a safety device which prevents any untimely opening during diving.

15 The lower part 12 of the binnacle 11 comprises a tunnel 21 allowing the midships of the marine vehicle to be reduced, consequently reducing the power necessary to propel this marine vehicle. The lower part 12 also comprises ballast to ensure the semi-submersion of the marine vehicle 1. This
20 ballast is housed in two compartments 22, 23, situated either side of the tunnel 21 and can consist of lead shot or of concrete. In case of difficulty, the two compartments are provided with trapdoors 24, 25 which allow the ballast to be jettisoned immediately, ensuring a practically instantaneous
25 surfacing of the marine vehicle 1.

The binnacle 11 is divided into two compartments 26, 27, one of them, 26, being for passengers, and the other 27 for containing the various elements necessary for the propulsion of the marine vehicle 1 in semi-submersion. In the first
30 compartment 26 are the seats 15, 16, allowing the passengers to sit down and work with their feet the means of propulsion on the surface using the muscular energy of the passengers. These means are pedals 28, 29 connected by chains 30, 31 to a bell crank 32 housed in the second compartment 27. This bell crank 32 permits the rotation of a shaft 33 whose rear

extremity 34 projects outside the binnacle 11. This rear extremity 34 comprises a screw 35 ensuring the advance and/or reversal of the marine vehicle 1. To facilitate respectively this advance or reversal, the tubes 2, 3 comprise at their front 7 and rear 8 extremities conical heads 36, 37, 38, 39.

The second compartment 27 also houses the means of propulsion when the marine vehicle 1 is in the semi-submerged position. These means are a motor group 40 and more particularly a small marine engine. This is also connected to the bell crank 32. The latter is provided with a clutch which, if the motor group 40 fails, allows the shaft 33 to be rotated by the pedals 28, 29 activated by the passengers. The motor group 40 can be activated by a control element 41. Apart from the shaft 33 which carries the screw 35, the motor group 40 drives a compressor 42. In addition, to increase the autonomy of the marine vehicle 1, a fuel tank can be provided.

To create air circulation in the binnacle 11 and thus ensure ventilation and demisting, the passengers, via the pedals 28, 29, activate a fan which fans the air coming from an intake 46 fitted on the snorkel 20 and emerging in the upper part of the binnacle 11.

The latter also contains the control equipment such as the compass, the gauges for the air pressure in the air bottles 43, 44, the fuel level, and the depth.

The invention incorporates an automatic control system to control the diving and surfacing operations. This system receives signals from three capacitive detectors mounted on the outer wall on the semi-submersible marine vehicle, which detect and send a signal to indicate whether the vehicle is on the surface, in a semi-submerged, or maximum diving position.

According to these signals and the indication supplied to the operator of the vehicle, the automatic control system controls the diving and the surfacing operations by solenoid valves which either direct air from the compressor 42 to inflate the ballast 5, 6 or exhaust air to deflate the ballast, or in case of failure of the inflation system jettisons the ballast compartments 22, 23.

Additionally the automatic control system corrects the trim and list of the vehicle during diving and surfacing operations. This correction takes place without manual intervention and is made on the basis of the output of a photoelectric cell detecting the behaviour of a ballast disc in front of a light beam. The automatic control system operates solenoid valves to inflate or deflate each pair of balloons as

required. Two solenoid valves correspond to each pair of balloons one for inflation and one for deflation.

The binnacle 11 can also be provided with air bottles 43, 44 for use in an emergency situation. These bottles can either be actuated 5 manually or automatically by a pressurestat via a bypass line 45.

The pressurestat is connected to the automatic control system to operate the rapid resurfacing of the marine vehicle when necessary, or to prevent diving taking place should the pressure in the air bottles be lower than a preset minimum.

10 Alternatively, a fourth capacitive pickup located at the upper end of sniffing valve 20 can be used to provide the signal for rapid resurfacing.

15 The ballast is preferably housed in two compartments 22, 23 in the form of a rod; the compartments are located adjacent tunnel 21 and are supported by releasable or "twist-lock" attachment means on rails which are integral with the structural of binnacle 11. These releasable attachment means make it possible, with the aid of an automatic jettisoning device, to release the ballast-forming compartments 22, 23 20 from the marine vehicle and to order immediate resurfacing of the same.

According to a preferred embodiment, the releasable or twist-lock 25 attachment means are formed by hooks pivotally mounted on the above-cited rails. These hooks engage gripping means which are integral with compartments 22, 23 and consist of snugs protruding over the lateral edges of the compartments. The device for automatic jettisoning of compartments 22, 23 comprises means for rotating the hooks for the purpose of disengaging the snugs from them. These rotating means consist of a screwjack (actuator) located inside binnacle 11 and turning a rod passing through the bottom of the same. This rod, in turn, is tied by two levers to the above-cited hooks to rotate the same around a 30 horizontal axis.

The screwjacks (actuators) are preferably pneumatic and supplied with air from an air bottle mounted behind passenger seats 15, 16. The release of air from this air bottle can be conveniently initiated either from the upper end of sniffing valve 20 or from the place of the pilot of 35 the marine vehicle. In order to obtain greater safety, one can provide for having this air bottle co-operate with a pressure gauge connected with computerised steering means. Thus, in the case of a pressure indication below a threshold value, the computerised steering means can prohibit a diving operation.

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In case of discomfort, there is a timer coupled to the pedals 28, 29. If it finds that the pedals are not moving, it will trigger the jettisoning of the ballast for immediate surfacing.

5 To steer the marine vehicle 1, it has a double rudder situated either side of the screw 35 and activated by a lateral arm.

To facilitate access to the binnacle 11, the rear extremities 8 of the tubes 2, 3 are connected by a bridge 47.

The snorkel 20 also comprises an air intake for taking in the air necessary for the motor group 20, and a periscope 48.

10 Although the invention has been described in relation to a particular form of realization, it is obviously not in the least limited, and various modifications of shapes, materials and combinations of these different elements can be made without departing from the context and spirit of the invention.

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The claims defining the invention are as follows:

1. A semi-submersible marine vehicle suitable for operation on a water's surface or semi-submersed, said marine vehicle comprising a spherical shaped compartment supported by a plurality of floats, said compartment housing a plurality of seats and propulsion means, wherein said propulsion means allows manual driving when the vehicle is on the surface of the water and motor assisted driving when semi-submersed, said compartment being water-tight and transparent, and wherein each float contains a ballast.

2. The marine vehicle of claim 1 further comprising control equipment comprising a depth meter coupled to a level detector, a monitor for checking the pressure of the air in air bottles, a monitor indicating fuel level and safety devices including a timer coupled to the propulsion means which triggers the automatic jettisoning of the ballast upon detection of zero propulsion when in the semi-submersed mode.

3. The marine vehicle of either claim 1 or 2 wherein the manual propulsion means comprises pedals driving a shaft with a screw situated on the end thereof, and said motor assisted driving means comprises a small marine engine which is activated by a passenger via a control element, said manual and motor propulsion means including a clutch allowing the changing from manual to motor assisted.

4. The marine vehicle of any one of claims 1 to 3, wherein the compartment comprises two sections of which one section houses the means of manual propulsion and other section houses the means of motor assisted propulsion; further comprising a tunnel provided in a lower part of the compartment allowing the reduction of the midships of the marine vehicle and the power necessary to propel it; housings for ballast are situated either side of the tunnel and have provided with a trapdoor for jettisoning the ballast in case of an incident; and a fan housed in the compartment for circulating the air coming from an air intake and for demisting, this fan being activated by the manual propulsion means.

5. The marine vehicle of any one of the preceding claims, further comprising a cupola covering the compartment, said cupola capable of being folded back around a horizontal axis of articulation with the aid of a handle provided with a safety device which prevents any untimely opening during diving; said cupola having a snorkel fitted with an air intake for air circulation in said compartment, an air intake for the motor and a periscope.

6. The marine vehicle of any one of the preceding claims, further comprising a compressor activated by the motor and supplying air either to emergency air bottles or to the ballasts in the floats; a pressurestat being provided activating a bypass for putting the emergency air bottles into action in case of a failure of the compressor.

7. A semi-submersible marine vehicle substantially as hereinbefore described with reference to the accompanying drawings.

DATED this THIRTIETH day of JULY 1987

ANDRE GASS

Patent Attorneys for the Applicant

SPRUSON & FERGUSON

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FIG. 1

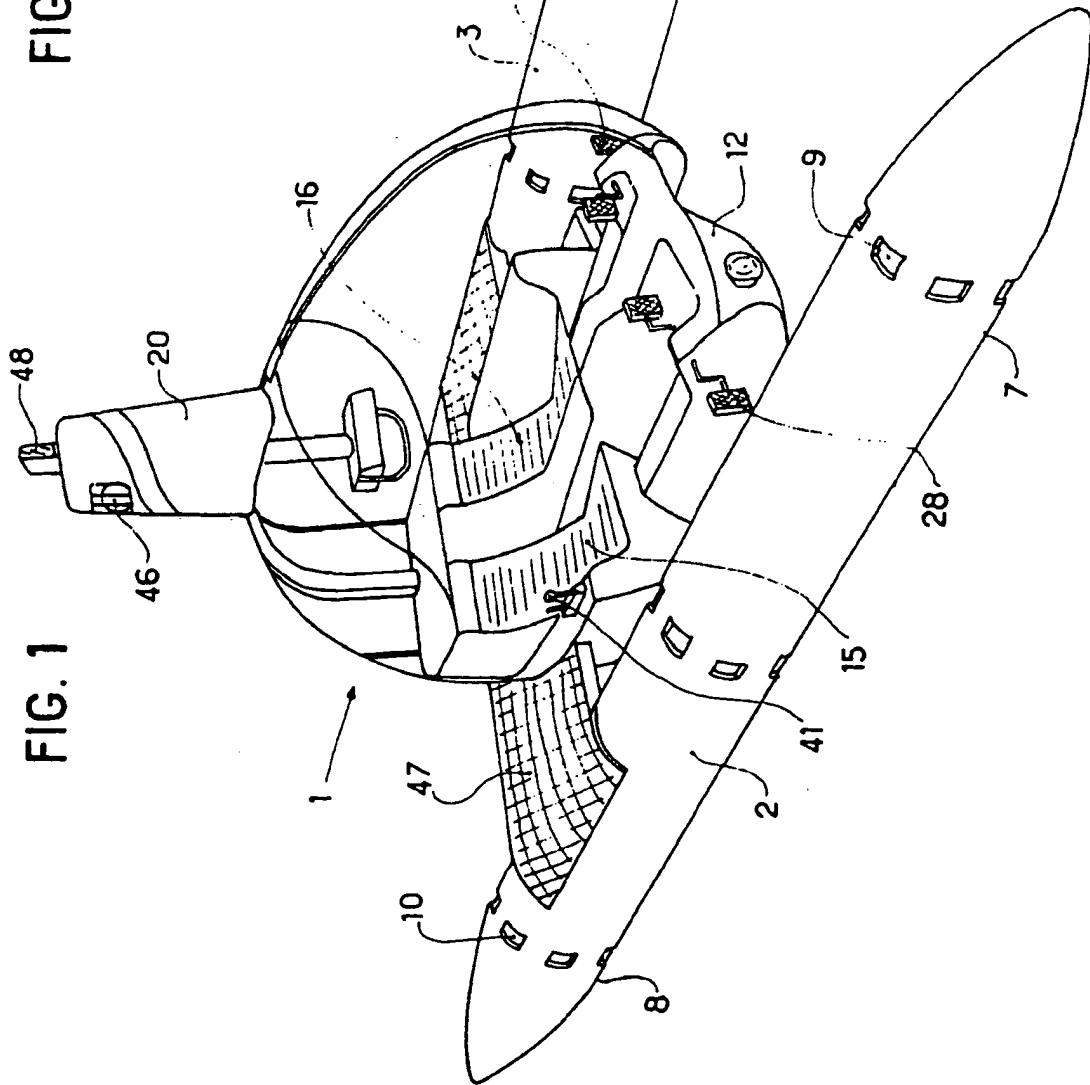
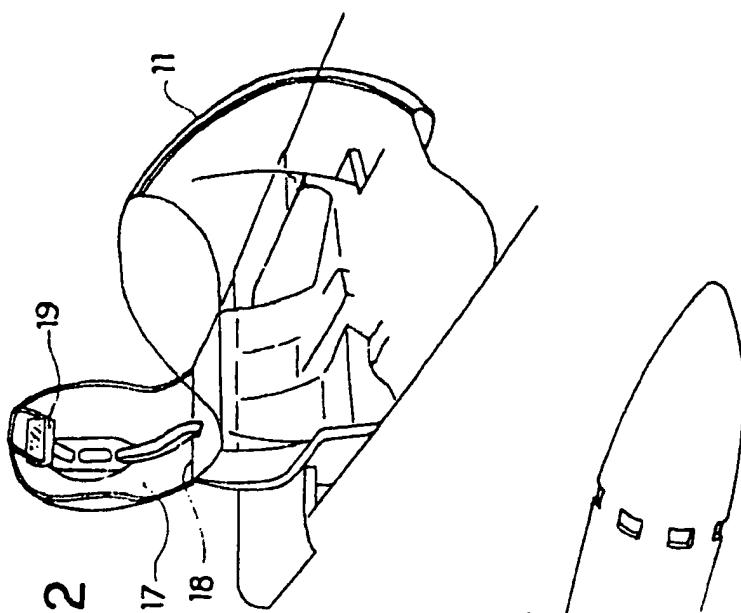


FIG. 2



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FIG. 3

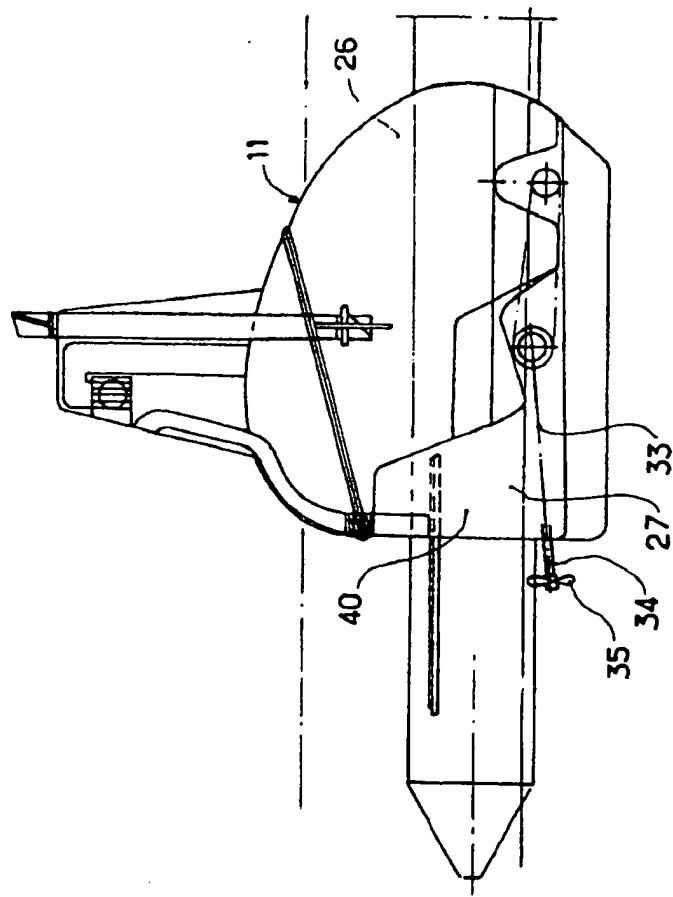
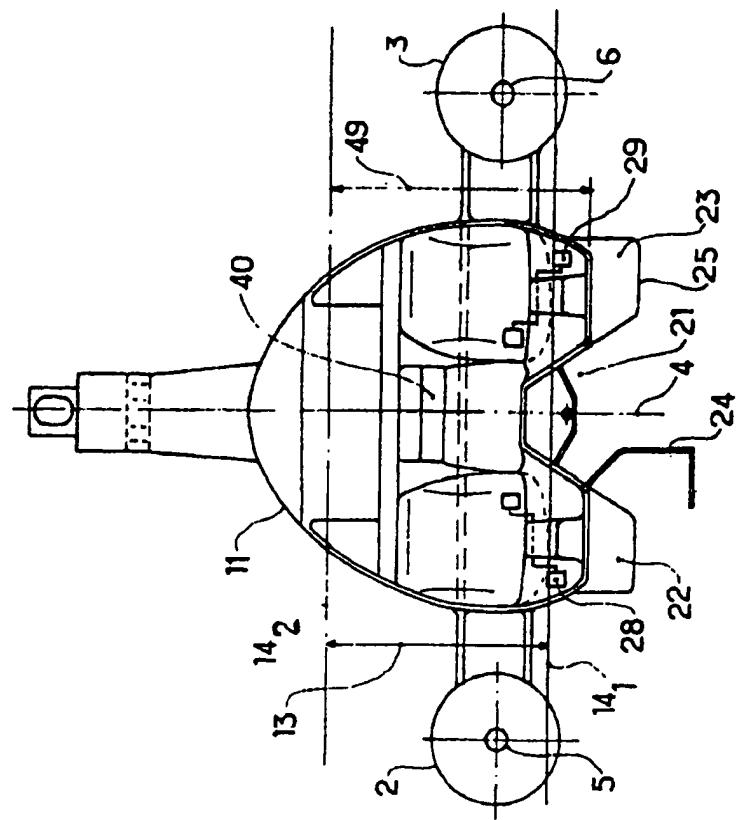


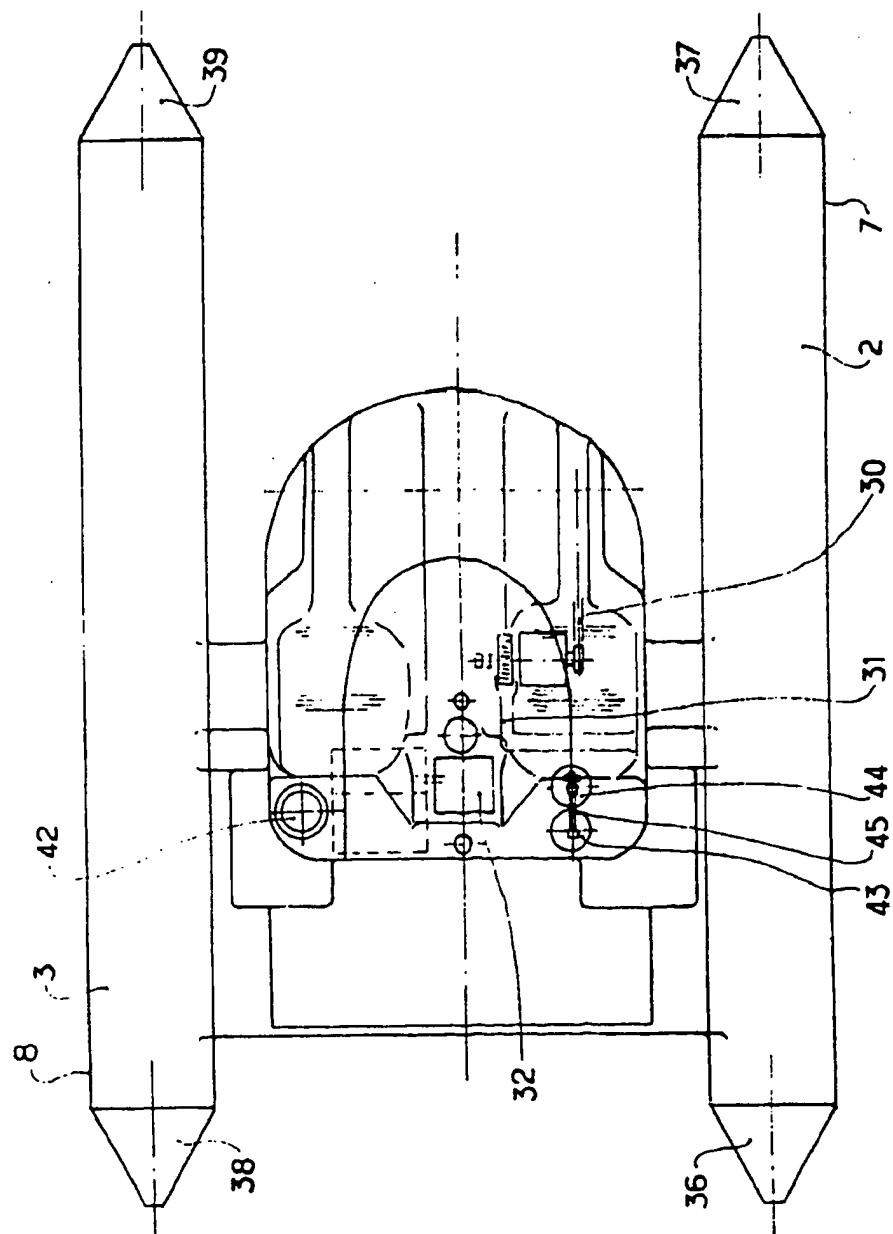
FIG. 4



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FIG. 5



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